The Examiner objected to the drawing figures under 37 CFR 1.83(a) for not showing every claimed feature of the invention. In particular, the Examiner interprets claims 6 and 12 as claiming 2 distinct optical fibers, and is requiring that 2 optical fibers be shown in the drawing figures. Applicant urges that the Examiner is incorrect in his interpretation of claims 6 and 12, in that the present invention is related to a mirror arrangement in which a first light signal is taken from an optical fiber, transformed and coupled back into the original optical fiber. It is therefore unnecessary for the figures to describe and illustrate two distinct optical fibers. Reconsideration and withdrawal of this objection are respectfully requested.

The Examiner objected to claims 6 and 12, stating that the phrases "from an optical fiber coupling the . . . rotated optical signal back into the optical fiber" appeared to be erroneous. For the reasons stated above in connection with the objection to the drawing figures, Applicant urges that the Examiner's interpretation of claims 6 and 12 is incorrect. The present invention is related to a mirror arrangement in which a first light signal is taken from an optical fiber, transformed and coupled back into the original optical fiber. It is therefore unnecessary for the claims to describe and illustrate two distinct optical fibers. Reconsideration and withdrawal of these objections are respectfully requested.

The Examiner rejected claims 1-13 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,574,595 (Kurata, *et al.*).

Applicant respectfully traverses this rejection.

In order for a reference to anticipate a claim under § 102, that reference must disclose every claimed limitation of the claim, either explicitly, or under the principle of inherency. Applicant's invention as claimed in independent claims 1, 7, and 13, is directed to an optical device for providing a polarization rotation to an optical signal. The invention requires a single birefringent element for splitting and recombining the polarization states of the single optical signal.

Kurata discloses an optical isolator in which an input light signal from an optical fiber 1 passes through a birefringent element 5 to separate two orthogonal polarization states, then through prism 8, lens 7, Faraday rotator 10, and a reflection mechanism comprising lenses 11 and 13, a second birefringent element 12, and mirror 14. The reflection mechanism reflects the separated light signals back through the Faraday rotator 10 with a spatial shift, to pass through the lens 7, prism 8 and into a third birefringent element 6 which couples the light signal into a second optical fiber 2. In a reverse direction, as shown in Figure 2 of Kurata, an optical light signal from optical fiber 2 passes first through the third birefringent element 6 which splits the light signal into two spatially shifted polarization states. The spatial separation is maintained through the remaining optical elements and the spatial separation of the states is increased when the light signal passes through the first birefringent element 5 such that the optical signal is not coupled into optical fiber 1. Thus the optical signal from optical fiber 1 is isolated into optical fiber 2, and the light signal from optical fiber 2 is filtered.

The isolator of Kurata works because of the cooperative arrangement of the three birefringent elements 5, 6, 12 that act together to create a spatial separation in the polarization states of the light signals passing through the birefringent elements. Column 5, lines 48 to 52, describe the important relationship of the birefringent elements 5, 6 12 in spatially separating extraordinary rays from ordinary rays. The cooperating nature of the birefringent elements 5, 6 is essential to isolate one of the optical signals.

The function of the optical isolator is best summarized in the paragraph in column 8, lines 55 to 61, in which it is described that the input optical signal 40 projected from the optical fiber in the forward direction is coupled to the optical fiber 2 without transmission loss, while the optical signal 54 exiting optical fiber 2 in a reverse direction is intercepted completely. At column 7, lines 35 to 40, Kurata specifically teaches that the recombined optical signal "is *identical* to the original input optical signal." That is, Kurata relates to preserving one optical signal from one optical fiber while removing a second optical signal from a second optical fiber.

In contrast, the splitting of the polarization components using a single birefringent element and subsequently recombining the polarization components using the same birefringent material, as recited in the claims, provides a substantially simpler arrangement than that disclosed in Kurata. To emphasize: in Applicant's claims, the same birefringent material is used for splitting and recombining of the polarization components. The system of Kurata does not teach or contemplate the use of a single birefringent material because it is necessary to have at least two differing birefringent materials that affect the extraordinary rays in a different manner, in order to achieve the optical isolation function taught by Kurata. (See column 8, lines 31 -47.)

As discussed on page 4, line 12 of the present specification, the advantages of the Applicant's system include that the present invention allows for accurate polarization rotation because only the components that are rotated through the desired angle are transmitted by the system. Any components that are rotated to a greater or lesser degree due to temperature and/or wavelength errors are not transmitted. One functional embodiment is described in which the polarization states are rotated by 90° providing a high extinction ratio of polarization effects when the polarization states are coupled into the original fiber because the 90° rotated components incur equal relative losses through the path of the optical device. The mirror arrangement of this embodiment in which an optical signal is coupled back into the same optical fiber is in part achieved because only a single birefringent element is used.

Thus, since Kurata does not disclose every limitation of Applicant's independent claims 1, 7, and 13, Kurata does not anticipate Applicant's claims 1, 6, and 13. Reconsideration and withdrawal of these rejections are respectfully requested.

Claims 2-6 and 8-12 depend upon, respectively, independent claims 1 and 7, and are thus patentable for the same reasons as those claims. Reconsideration and withdrawal of these rejections are respectfully requested.

## CONCLUSION

Applicant urges that for the above stated reasons claims 1-13 are in condition for

allowance. Early and favorable action is earnestly solicited. If the Examiner believes that issues can be resolved through a telephone interview, the Examiner is urged to call the undersigned at the telephone number listed below.

Respectfully submitted,

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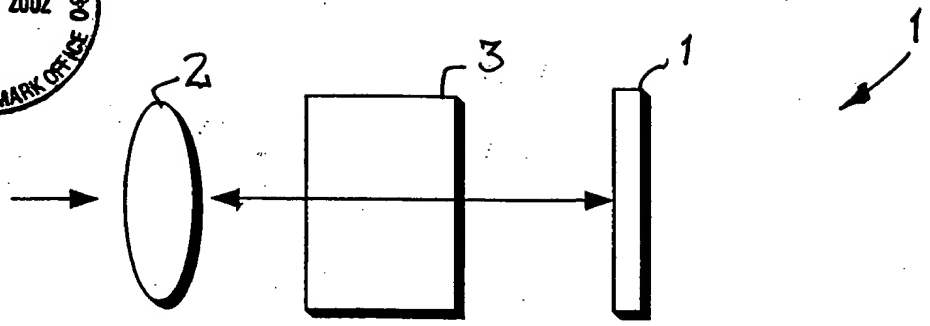


FIG. 1
Prior Art

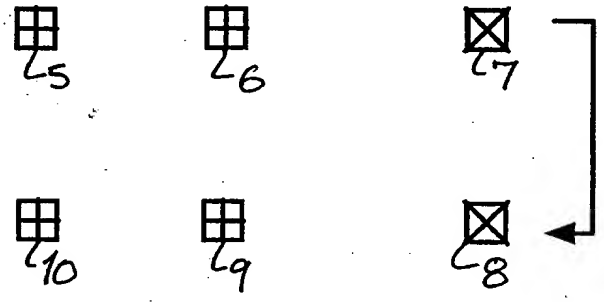


FIG. 2

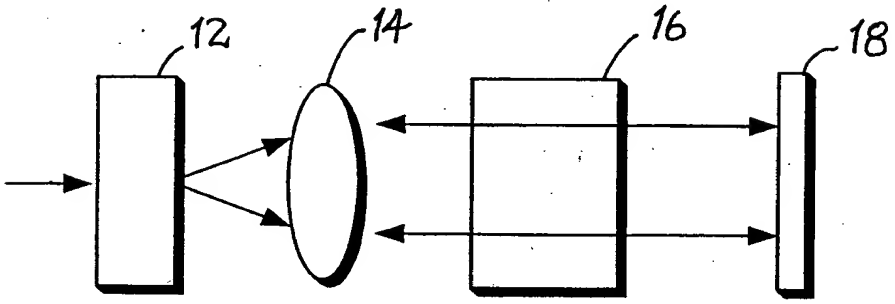


FIG. 3

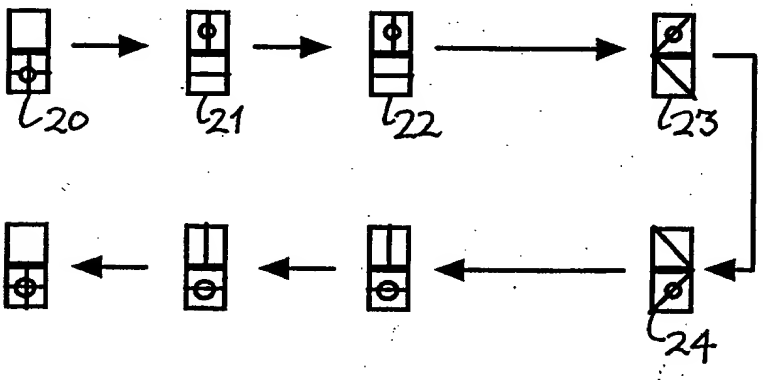


FIG. 4